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10/650,323	08/28/2003	Norman Herron	UC0220 US NA	6878

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WILMINGTON, DE 19805

EXAMINER
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YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/650,323

Applicant(s)

HERRON ET AL.

Examiner

Marie R. Yamnitzky

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1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 February 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-11,15 and 17-32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 30 is/are allowed.  
6) ☒ Claim(s) 1-7,10,11,17-29 and 31 is/are rejected.  
7) ☒ Claim(s) 9,15 and 32 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 08 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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1. This Office action is in response to applicant's amendment received February 08, 2006, which amends the specification including the abstract, amends claims 1, 6, 9, 10, 15, 17, 18, 22, 23, 27 and 28, cancels claims 8, 12-14 and 16, adds claims 29-32, and provides replacement sheets for all the drawings.

The examiner notes that claim 32 as set forth in the amendment received February 08, 2006 should have the status identifier --(New)--.

2. The drawing replacement sheets received February 08, 2006 overcome the objection with respect to Figure 2 as set forth in the Office action mailed October 06, 2005. However, the drawing replacement sheets introduce new matter for reasons set forth later in this action.

The objection to the abstract as set forth in the October 06<sup>th</sup> action is overcome by the February 08<sup>th</sup> amendment.

The objection to the disclosure for informalities as set forth in the October 06<sup>th</sup> action is overcome by the February 08<sup>th</sup> amendment.

The rejection under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, as set forth in the October 06<sup>th</sup> action is partly rendered moot by claim cancellation and otherwise overcome by claim amendment.

The rejection under 35 U.S.C. 102(b) based on Kawamura et al. in *J. Appl. Phys.* 92(1) is overcome by the February 08<sup>th</sup> amendment. This reference is not applicable against any of the present claims.

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The rejection under 35 U.S.C. 102(b) based on Igarashi et al. (US 2002/0048689 A1) is overcome by the February 08<sup>th</sup> amendment. This reference is not applicable against any of the present claims.

The rejection under 35 U.S.C. 102(b) based on Lamansky et al. (WO 02/15645 A1) is overcome by the February 08<sup>th</sup> amendment.

The rejection under 35 U.S.C. 103(a) based on Lamansky et al. (WO 02/15645 A1) is partly rendered moot by claim cancellation and otherwise overcome by claim amendment. Lamansky et al. is reapplied to new claim 29, which corresponds to prior claim 12, and to new claim 31.

3. The amendment filed February 08, 2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The replacement sheets for the drawings include changes to formulae in some of the figures that are not clearly supported by the application as originally filed. In particular, compare Fig. 8 and Fig. 9 on page 4/4 of the replacement sheets to original Fig. 8 and Fig. 9. The Bz<sub>2</sub>P group shown in the lower half of Fig. 8 of the replacement sheet was previously shown as a PBz<sub>3</sub> group. The two PPh<sub>2</sub>Bz groups in Fig. 9 of the replacement sheet are shown as bonded to Ir through the Ph portion, but were previously shown as bonded to Ir through the phosphorous.

Applicant is required to cancel the new matter in the reply to this Office Action.

4. The drawings are objected to because some of the figures on the replacement sheets filed February 08, 2006 introduce new matter into the disclosure for reasons noted in the objection to the amendment. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1-7, 10, 11 and 17-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Igarashi et al. (US 2001/0019782 A1).

Each of Igarashi's specific iridium complexes represented by formulae (1-23) through (1-32) on pages 12-13 meet the limitations of the luminescent organometallic complex composition as defined in present claim 1 and further defined in present claims 2-4.

Igarashi's iridium complexes represented by formulae (1-26) and (1-28) further meet the limitations of the composition as claimed in claims 5 and 10.

Igarashi's iridium complex represented by formula (1-26) further meets the limitations of the composition as claimed in claims 6 and 7.

For example, Igarashi's iridium complex represented by formula (1-26) has three monoanionic bidentate ligands. Each of the three ligands is coordinated through a nitrogen of a heteroaromatic ring and a carbon of an aromatic group. Two of the three ligands are ligands having Formula III as defined in present claim 1 wherein m is 1 and p is 1, which also meet the limitations of an orthometallated aryl group ligand as required by claim 10. One of the three ligands is a ligand having Formula I as defined in present claim 6 wherein E is CR<sup>1</sup> and each R<sup>1</sup> is H, which also meets the limitations of an arylheterocycle ligand as required by claim 4, a phenylpyridine ligand as required by claim 7, and an orthometallated aryl group ligand as required by claim 10.

With respect to present claim 11, at least Igarashi's iridium complex of formula (1-24) meets the claim limitations. See paragraph [0160].

With respect to present claims 17-26, Igarashi's iridium complexes are used as light-emitting materials in an electronic device comprising a pair of electrodes and a light-emitting layer. The device may also comprise a layer of charge transport material between the light-emitting layer and at least one of the electrodes. For example, see paragraphs [0135]-[0150].

With respect to present claims 27 and 28, Igarashi's iridium complexes of formulae (1-23) through (1-32) are compositions having a Formula IV as required by claim 27, and are organometallic complexes as required by claim 28. Igarashi et al. do not specifically disclose that any of the complexes emit blue light as required by claims 27 and 28, but the present specification teaches that "blue" indicates any color that appear bluish to the naked human eye, "including light of wavelengths ranging from 440 nm to 540 nm" (p. 3, l. 22-24). Igarashi et al. disclose that the complex of formula (1-24) provides a device that emits light having a peak emission wavelength ( $\lambda_{\text{max}}$ ) in the range of 440 nm to 540 nm, though the color of emission is described as green. However, since the peak emission wavelength is in the range disclosed in the present specification as "blue", the prior art is considered to anticipate claims 27 and 28.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamansky et al. (WO 02/15645 A1).

Lamansky et al. disclose phosphorescent organometallic compounds comprising a transition metal and having at least one monoanionic, bidentate, carbon-coordination ligand and at least one ligand that is not monoanionic and/or not bidentate and/or not a carbon-coordination ligand.

The combination of iridium and ligands required for the composition as defined in present claim 29 and composition represented by the first formula in present claim 31 are suggested by Lamansky et al.

The monoanionic, bidentate, carbon-coordination ligand may be a phenylpyridine ligand with substituents. For example, see the second and ninth formulae in claim 5, and see the second and third formulae in claim 6 of the WO publication. The second and third formulae in claim 6 represent two specific substituted phenylpyridine ligands, with the second formula in claim 6 of the prior art being similar to the phenylpyridine ligand shown in the first formula in present claim 31.

The at least one ligand that is not monoanionic and/or not bidentate and/or not a carbon-coordination ligand may be a hydride such as when at least one ligand is  $-R$  as in claim 7 of the WO publication wherein  $R$  is hydrogen.

The compounds may also have a phosphine ligand. The penultimate formula in claim 7 represents a triarylphosphine ligand.



Regarding the combination of ligands required for the composition represented by the first formula in present claim 31, Lamansky's organometallic compounds may have more than one ligand that is not monoanionic and/or not bidentate and/or not a carbon-coordination ligand, and  $-H$ ,  $-Cl$  and  $-PPh_3$  are all disclosed as possible ligands. For example, see  $-R$  in claim 7, the penultimate formula in claim 7, and the fourteenth and fifteenth formulae in claim 8. Also see claim 9.

Lamansky et al. do not disclose a specific example of an organometallic compound meeting the limitations of present claim 29 or represented by the first formula in claim 31, but such compounds are within the scope of Lamansky's disclosure and suggested by the ligands set forth in Lamansky's claims.

Absent a showing of superior/unexpected results provided by the composition of present claim 29 or the composition represented by the first formula in present claim 31, it is the examiner's position that these compositions would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention given Lamansky's disclosure. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make various phosphorescent organometallic compounds within the scope of Lamansky's disclosure in order to provide various compounds suitable for use as light-emitters in light-emitting devices. Guided by Lamansky's teachings regarding the effect of different ligands, it would have been within the level of ordinary skill of a worker in the art to select suitable and optimum combinations of ligands from those taught by Lamansky in order to provide organometallic compounds capable of being used in a device as taught by Lamansky.

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9. Applicant's arguments filed February 08, 2006 have been fully considered but they are not persuasive with respect to the prior art as applied in this action.

Regarding the rejection based on US 2001/0019782 A1 to Igarashi et al., contrary to applicant's arguments, the prior art does disclose iridium complexes having a ligand of Formula III as defined in amended claims 1, 17, 22, 27 and 28.

Regarding the rejection based on WO 02/15645 to Lamansky et al., the examiner agrees that Lamansky et al. do not anticipate the presently claimed subject matter, but is of the position that Lamansky et al. suggest the subject matter of present claim 29 and one of the six specific complexes represented by the formulae of present claim 31.


10. Claim 30 is allowed.

Claims 9, 15 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY  
April 28, 2006

  
MARIE YAMNITZKY  
PRIMARY EXAMINER  
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